MULTIMEDIA

(Applied Technology Education) Standards and Objectives

A Project of the Utah State Office of Education

Steven O. Laing, Ed.D.
State Superintendent of Public Instruction

Bonnie Morgan
Associate Superintendent
Instructional Services

Mary Shumway
State Director
Applied Technology Education

Parker K. (Duke) Mossman
Education Specialist
Information Technology

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FOREWORD

In 1994, the Utah Education Network (UEN), the Utah State Office of Education, and Utah=s Applied Technology Centers initiated a program to address a growing job demand for multimedia technicians in Utah. This curriculum outline is an overview of the best practices from teachers who have placed students in meaningful employment, internships, and concurrent enrollment programs after students satisfactorily met basic competencies in multimedia.

This curriculum guide is designed only to meet the goals of Applied Technology Education (ATE) and is not founded on any specific hardware or software requirements. The purpose of this curriculum guide is to provide structure for the delivery of basic Core skills and knowledge in multimedia. This standardization of curriculum provides a consistent format for evaluation and certification of students= skills, while allowing programs to access a wide variety of delivery strategies and resources.

This Multimedia program consists of two one-year courses: Multimedia I - Design and Development, and Multimedia II - Production.

For further assistance with issues related to ATE programs in multimedia, contact the Applied Technology Education Division of the Utah State Office of Education at (801) 538-7840.

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Duke Mossman, Project Leader
Utah State Office of Education

Multimedia I & II Writing Team Members:
Lorelie Andrus, Orem High School
Allen Arko, Jordan Technical Center
Brian Clark, Taylorsville High School
John Davidson, Bridgerland Applied Technology Center
Ann Decker, Timpview High School
Gary Dunn, Lone Peak High School
Wynn Farr, Fremont High School
Stacie Gomm, Mountain Crest High School
Kaylene Johnson, Skyview High School
Tim Miller, Uintah Basin Applied Technology Center
Audrey Nelson, Cottonwood High School
Becky Smith, Layton High School
Tara Thornton, Timpview High School
Bob Tyrrell, Skyline High School
Brett Zabel, Wasatch High School

Additonal 2002 Revision Team Members:
Nathan Allen, Allen Academy of E-learning
Richard Caldwell, Alta High School
Jared Berrett, Brigham Young University
Rodayne Esmay, Salt Lake Community College
Kim Jones, Verite Multimedia
Lori Palmer, Utah Valley State College
Chet Poulton, CFour Communications
Ken Rice, Viewmont High School
Jenica Taylor, Salt Lake Community College
Rex Thornock, Ogden-Weber Applied Technology College

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Multimedia I - Design & Development

Grade Levels: 10-12
Units of Credit: 1
CIP Code: 11.0210
Prerequisite: Keyboarding Proficiency and Computer Technology (Computer Literacy)
Skill Certification Exam: #801

COURSE DESCRIPTION

Multimedia is the process of planning, instructional design, and development. Multimedia I - Design and Development is the first-year multimedia course where students will create interactive computer applications to be delivered on CD-ROM, Internet or other delivery media using the elements of text, graphics, animation, sound, video, and digital imaging. These skills can prepare students for entry-level positions and other occupational/educational goals.

COURSE STANDARDS AND OBJECTIVES

STANDARD

110210-01 Students will develop an awareness of multimedia career opportunities and an overview of the relevant history of the computer industry.

OBJECTIVES

110210-0101 Develop career awareness related to working in the multimedia industry.

- Identify personal interests and abilities related to multimedia careers
  - Identify personal creative talents
  - Identify technical/programming talents
  - Identify organizational and leadership skills
  - Explore aptitude for innovation
  - Determine aptitude for working as a member of a multimedia team
- Identify multimedia career fields
  - *Graphic Artist*
  - *Programmer*
  - *Multimedia Designer/Developer*
  - *Media/Instructional Designer*
  - *Web Designer/Specialist*
- Investigate career opportunities, trends, and requirements related to multimedia careers
  - Identify the members of a multimedia team: graphic/commercial artist, project manager, technical writer, application programmer, video and sound specialist, and subject matter expert
  - Describe work performed by each member of the multimedia team
  - Investigate trends associated with multimedia careers
  - Develop a realistic Student Education Occupation Plan (*SEOP*) to help guide further educational pursuits
- Identify factors for employability and advancement in multimedia careers
  - Survey existing multimedia businesses to determine what training is required
  - Survey universities and colleges to determine training availability
  - Develop employability competencies/characteristics: responsibility, dependability, ethics, respect, and cooperation

- Achieve high standards of personal performance with a positive work ethic and attitude

110210-0102 Discuss the relevant history of computer technology/multimedia

STANDARD
110210-02 Students will demonstrate the ability to perform basic computer functions on a standard platform (*PC* and/or *Mac*).

OBJECTIVES:
110210-0201 Perform basic operating system functions.
- Minimize & maximize windows
- Understand the make up of a window (e.g., Tool Bar, Menu Bar, etc.)
- *Multitask*
- Utilize the *Clipboard*

110210-0202 Perform basic file commands.
- Save files
- Rename files
- Copy files
- Open/Close files
- Back up files
- Print files
- Delete files
- Compress files

110210-0203 Demonstrate the ability to convert a file to a format that may be more appropriate for a project.
- Convert files

110210-0204 Demonstrate the ability to manage files on a *PC* and network
- Create folders
- Create and use appropriate directory and path structures
- Copy files between folders
- Understand the organization of files on a hard drive and a network
- Understand file size/computer speed terminology (e.g., KB. MB. GB, MHz, etc)
- Understand LAN, WAN, IP, and *FTP*

110210-0205 Know the information available in hardware and software documentation, and use the help menus when needed.

110210-0206 Compare and contrast various types of file formats appropriate for the relevant computer platform.
- Identify graphic formats (e.g., JPG, GIF, TIF, BMP, PSD, WMF, PNG, PDF, EPS, AI, etc.)
- Identify audio formats (e.g., WAV, MID, AU, MP3, AIF, RA, etc.)
- Identify video formats (e.g., AVI, MOV, DV, etc.)
- Identify animation formats (e.g., FLI, SWF, FLA, SHO, etc.)
- Identify miscellaneous formats (e.g., EXE, TXT, RTF, DOC, etc.)

110210-0207 Describe the components of a basic multimedia computer system.

- Know the "current" hardware specifications and capabilities of:
  - Processors
  - *RAM* (memory)
  - Hard drive capacity
  - CD-ROM/DVD
  - Audio playback and recording capability (includes sound card and speakers)
  - Graphics performance (may include graphics card)
  - Video playback
  - User input (i.e., keyboard, mouse, microphone)
  - *USB*, *USB*2, IEEE 1394 (Firewire)
  - Other storage *media*
  - System Software (i.e., Windows, *Mac* OS, or Workstation)
- Know the "current" peripherals available for multimedia systems:
  - *Input devices,* including scanning devices, digital cameras, drawing tablets, DAT recorders, digital/analog video cameras, digital audio-tape devices, microphones, video capture cards and devices, etc.
  - *Output devices,* including monitors, CD/DVD burners, speakers, presentation devices (i.e., LCD projectors), smart boards, printers, auxiliary storage (i.e., zip drives), etc.
- Identify current *virus* information

110210-0208 Utilize shortcut keys and quick-stroke commands where applicable in software applications and OS to improve performance.

110210-0209 Adhere to the individual school's acceptable use policy.

STANDARD

110210-03 Students will apply principles and elements of visual design while creating multimedia projects.

OBJECTIVES

110210-0301 Demonstrate the ability to make decisions about the use of formal elements of design.

- Recognize and effectively demonstrate the use of color including *hue*, *value*, and *saturation* for emotional impact and emphasis as appropriate for the projects output medium (computer, video or web)
- Recognize and effectively demonstrate the use of linear and non-linear *shape*
- Recognize and effectively demonstrate the use of *line* including line direction and quality to create the illusion of spatial depth and perspective
- Recognize and demonstrate the use of *texture* to create *patterns*, *emphasis* and *dimension*
- Recognize and demonstrate the use of *value* to create *contrast* and emphasize relationships or *dimension* among objects

110210-0302 Demonstrate the ability to make decisions about the use of the principles of design.

- Recognize and demonstrate the use of *balance* including *symmetrical* and *asymmetrical* to create distribution of visual weight as it pertains to composition

- Recognize and demonstrate the use of *emphasis* by manipulating elements and principles of design to create a visual hierarchy of focal points
- Recognize and demonstrate the use of *unity* to establish an integrated whole which is representative of the project's concept
- Recognize and demonstrate the use of *scale* and *proportion* to draw visual attention
- Recognize and demonstrate the use of positive and negative *space* to create the illusion of depth using size and position

110210-0303 Demonstrate the ability to make decisions about the use of typography principles to enhance communication.

- Select and use *fonts*, text styles, colors and sizes that are legible and appropriate to enhance the message of the project
- Recognize and demonstrate the use of serif and sans-serif fonts appropriately according to your message, audience, and the design format
- Recognize and demonstrate the ability to manipulate the spacing of words, lines, and lettering to improve the overall graphic layout

110210-0304 Demonstrate the ability to make effective decisions about digital imaging.

- Recognize and apply the size guidelines for photographic composition such as *mergers*, *simplicity*, *leading lines*, *rule of thirds*, *balance* and *framing*
- Recognize and apply appropriate settings for scanned and digital media as appropriate for the project's final output
- Demonstrate the ability to manipulate and enhance a digital photograph

STANDARD

110210-04 Students will demonstrate proper planning and design by utilizing an instructional design model such as ADDIE (Analyze, Design, Develop, Implement, Evaluate) in the development of *multimedia projects.*

OBJECTIVES

110210-0401 *(Analyze)* Develop the skills to gather and process contextual information affecting the structure, purpose, content, and design of a project.

- Identify the need(s) that will be met through the project (What is the purpose for this project?).
- Demonstrate an understanding of the specific target audience by capturing and incorporating relevant demographic information and other characteristics (preferences, reading level, computer experience, etc.).
- Identify technical constraints – determine delivery platform and medium.
- Prepare a brief project plan including milestones and due dates.

110210-0402 *(Design)* Develop the skills to write objectives, outline content, create a course map and storyboard layouts of user interface.

- Using a *SME* (subject matter expert) gather and organize content for the project in an outline.
- Write project objectives that will help meet project needs and goals-specifying what you want users to know, experience, or do after completing the project.
- Define a basic style guide for the project that may include color scheme and overall interface design.

- Select appropriate interactive, learner-centered activities.
- Storyboard screen layouts including appropriate visual design, instruction, and authoring techniques, as well as all necessary *media* (text, graphics, sound, audio, etc.).
- Store project design documentation.

110210-0403 *(Develop)* Apply digital media creation skills to populate course with relevant multimedia.

- Acquire and/or produce all necessary *media* for course following development guidelines in Standard 6.
- Create prototypes (first-breadth and first-depth).
- Author or produce project incorporating proper authoring techniques outlined in Standard 7.

110210-0404 *(Implement)* Apply implementation practices including publishing, testing, and refining the project.

- Publish, compile or render finished project.
- Conduct an *alpha test* with the help of the *SME* to ensure technical and instructional functionality and accuracy.
- Conduct a *beta test* with five people (non-project related) to ensure usability.
- Refine project as necessary.
- Gain project approval from project sponsor.

110210-0405 *(Evaluate)* Assess the effectiveness of the project and production experience.

- Collect evaluation data to determine if project is producing the desired results.
- Summarize your project experience (what you learned, plans to improve, etc.)

110210-0406 Recognize skills in project development to successfully produce a finished product for a standard delivery medium (discussion item in the first year).

- Discuss cost analysis of producing the project
- Discuss professional/commercial marketing presentation, such as CD cover, project packaging, and documentation
- Discuss an advertising theme, remembering to keep the target audience in mind
- Discuss a marketing plan to price and distribute the product
- Discuss the contents of a press release to announce the distribution of the product
- Discuss strengths and weaknesses of delivery mediums

STANDARD

110210-05 Students will participate in individual and team (group) activities.

OBJECTIVES

110210-0501 Demonstrate the ability to work individually in the completion of multimedia projects.

- Demonstrate oral, written, and/or technological communication skills
- Apply management skills in personal problem solutions

- Demonstrate personal initiative in problem solutions
- Complete projects according to specified deadlines

110210-0502 Demonstrate the ability to work as a team member in the completion of multimedia projects.
- Demonstrate oral, written, and/or technological communication skills
- Apply management skills in problem solutions
- Utilize organizational skills
- Demonstrate leadership ability
- Demonstrate willingness to compromise to meet team objectives
- Function as a responsible team member
- Describe the role and primary activities of each member of a multimedia development team (i.e., project manager, programmer, graphic artist, audio/video specialist, subject matter expert (*SME*)).

STANDARD
110210-06 Students will produce various forms of *media.*

OBJECTIVES
110210-0601 Create 2D graphics using a variety of formats and techniques.
- Create, manipulate and appropriately use *bitmap (raster)* graphics
- Create, manipulate and appropriately use *vector* graphics
- Effectively manipulate the *resolution* of graphic and photographic files

110210-0602 Create 2D animations
- Create keyframe and path animation
- Change position, scale, color, and properties of an animated object

110210-0603 Create digital video
- Demonstrate proper filming techniques
- Capture video from an original or existing source
- Edit video
- Demonstrate an understanding of analog vs. digital video
- Recognize and use appropriate video settings (e.g., frame rates, frame size, *compression*, etc.)
- Convert video files to appropriate formats for use with at least one of the following: CD-*ROM*, DVD or Internet

110210-0604 Create digital audio
- Sample (capture) sound from an original or existing source
- Edit sound
- Understand MIDI vs. WAV or AIF files
- Recognize and use appropriate settings for various types of sound
- Apply special effects to audio files

110210-0605 Create a personal archive of student work/projects

STANDARD
110210-07 Students will understand, define and identify various multimedia terminology, tools and strategies.

OBJECTIVES

110210-0701 Define and use relevant multimedia terminology (see glossary).

110210-0702 Identify the types of multimedia presentation modes for particular uses.
- Understand *linear mode* (forward direction only)
- Understand *random mode* (anywhere, anytime)
- Understand *directed linear mode* (forward and backward direction)
- Understand *sequential index mode* (menu guided)
- Understand *tree mode* (go down a path)

110210-0703 Understand appropriate use of authoring and delivery tools.
- *Rich media* authoring applications. (ie. Director, Quest, Toolbook, iShell and other authoring applications)
- Web development applications. (ie. Flash, Dreamweaver, Cold Fusion, Go Live, FrontPage and other similar creation applications)

STANDARD
110210-08 Students will use multimedia tools and authoring skills to develop a complete and functional interactive multimedia team project.

110210-0801 Produce project plan documentation using standard 4 as a guide

110210-0802 Determine when to produce original materials (graphics, audio, video, animations, etc.) and when to use copyrighted and/or royalty-free materials.
- Obtain permission and give credit to owners before using copyrighted materials
- Demonstrate the process of obtaining copyright and fair-use permission

110210-0803 Understand and follow fair-use guidelines and copyright laws as they apply to education and industry (see appendix for complete guidelines).
- Know the limitations on time, portion, copying, and distribution. Portion limitations mean the amount of a copyrighted work that can reasonably be used in qualifying educational multimedia projects – See appendix and/or USOE website for detailed information.
  - Motion Media
  - Text Material
  - Music, Lyrics, and Music Video
  - Illustrations and Photographs

110210-0804 Import and incorporate various forms of media needed for a project.

110210-0805 Utilize and incorporate interaction and navigational tools.
- Use menus when appropriate
- Use buttons where needed (i.e., Next, Back, Menu, Exit, etc.)

110210-0807 Create interfaces appropriate for the designed project.
- Create templates for backgrounds, buttons, etc., that correlate to the design of the project

110210-0808 Utilize "*timer events*"

- Dissolves, transitions, animations, etc.

110210-0809 Utilize "*user driven events*"

- *Rollovers*, Input boxes, Pop-up window, etc.

UTAH ATE SKILL CERTIFICATION
STUDENT PERFORMANCE EVALUATION
Test Number: #810 Test Name: Multimedia I - Design & Development

(PRINT) Student's Name: _____ Date: _____

(PRINT) Teacher's Name: _____ School: _____

Teacher's Signature: _____ District: _____

The performance evaluation **is a required component of the skill certification process**. Each student must be evaluated on the required performance objectives below. Performance objectives may be completed and evaluated anytime during the course. Students who achieve a 3 or 4 (moderately to highly skilled) on **ALL** performance objectives, and 80% on the written test will be issued and ATE skill certificate.

Instructions

- Students should be aware of their progress throughout the course, so that they can concentrate on the objectives that need improvement.
- Students should be encouraged to repeat the objectives until they have performed at a minimum of a number **3 or 4 on the rating scale (moderately to highly skilled level)**.

4 = highly skilled	Successfully demonstrated without supervision
3 = moderately skilled	Successfully demonstrated with limited supervision
2 = limited skill	Demonstrated with close supervision
1 = not skilled	Demonstration requires direct instruction and supervision

- When a performance objective has been achieved at a minimum of 80% (moderately to highly skilled level), "**Y" (Y=YES)** is recorded on the performance summary evaluation form. If a student does not achieve a 3 or a 4 (moderately to highly skilled level), then an "**N"(N=NO)** is recorded on the summary sheet for that objective.
  - All performance objectives **MUST** be completed and evaluated prior to the written test.
  - The teacher will bubble in "**A"** on the ATE skill certification answer sheet (SCANTRON) for item **#81** for students who have achieved "**Y"** on **ALL performance objectives**.
  - The teacher will bubble in "**B"** on the ATE skill certification answer sheet (SCANTRON) for item **#81** for students who have **ONE or more "N's"** on the performance objectives.
- The signed evaluation sheet(s) **MUST** be kept in the teacher's file for two years.
- A copy is also kept on file with the schools ATE skills certification testing coordinator for two years.

Multimedia I - Design and Development Performance Objectives

Yes		No		
4	3	2	1	**Standard 1 – The student has developed an awareness of multimedia career opportunities and the relevant history of the computer/multimedia industry.**
				☐ Understands career opportunities in the *multimedia* industry ☐ Demonstrated employability skills such as responsibility, dependability, ethics, respect and cooperation ☐ Performed with a positive work ethic and attitude ☐ Developed a realistic Student Education Occupation Plan (*SEOP*) to guide further educational/occupational pursuits
Yes		**No**		**Standard 2 – The student demonstrated the ability to perform basic computer functions on a standard platform (*PC* and/or *Mac).***
4	**3**	**2**	**1**	
				☐ Demonstrated basic operating system functions ☐ Demonstrated basic file commands ☐ Converted and/or compressed files to various formats when needed ☐ Demonstrated the ability to manage files on a *PC* and Network ☐ Used appropriate documentation and help features when needed ☐ Utilized shortcut keys and quick-stroke commands when needed ☐ Adhered to the school's acceptable use policy

Yes		No		
4	3	2	1	**Standard 3 – The student has applied principles and elements of visual design while creating multimedia projects.**
				☐ Demonstrated appropriate use of principles and elements of visual design
Yes		**No**		**Standard 4 – The student has demonstrated proper planning and design by utilizing an instructional model such as ADDIE in the development of *multimedia projects*.**
4	3	2	1	
				☐ Demonstrated the Analyze step in the ADDIE model by identifying project needs and audience ☐ Demonstrated the Design step in the ADDIE model by preparing a project outline, objectives, style guide, storyboard, first breadth prototype, and first depth prototype ☐ Demonstrated the Develop step in the ADDIE model by completing a project meeting deadlines and specifications proofreading for errors (technical, logical, grammar and spelling) ☐ Demonstrated the Implement step in the ADDIE model by conducting alpha and *beta testing* ☐ Demonstrated the Evaluate step in the ADDIE model by revising the project as requested by the client ☐ Understands the process of producing a finished multimedia product
Yes		**No**		**Standard 5 – The student has participated in individual and team (group) activities.**
4	3	2	1	
				☐ Demonstrated the ability to work individually in the completion of multimedia *projects* applying communication and problem solving skills ☐ Demonstrated the ability to work as a contributing member of a team in the completion of multimedia projects applying communication, management, organizational, leadership and compromise skills to meet team objectives
Yes		**No**		**Standard 6 – The student has produced various forms of media.**
4	3	2	1	
				☐ Created, scanned and manipulated 2D *bitmap* (raster) graphics ☐ Created and manipulated 2D *vector* graphics ☐ Created a key frame and path animation ☐ Captured and edited digital video demonstrating proper filming techniques ☐ Captured and edited digital audio ☐ Created a personal archive of work/projects
Yes		**No**		**Standard 7 – The student understands various *multimedia* strategies and objectives.**
4	3	2	1	
				☐ Demonstrated selecting the appropriate medium to develop and deliver multimedia projects ☐ Demonstrated knowledge of multimedia terminology and presentation modes
Yes		**No**		**Standard 8 – The student used *multimedia* tools and authoring skills to develop a complete and functional interactive *multimedia* group project.**
4	3	2	1	
				☐ Produced project plan documentation using standard 4 as a guide in collaboration with a subject matter expert (SME)/Client ☐ Created original *media* and interfaces for the project ☐ Obtained permission to use copyrighted materials where required and cited sources ☐ Demonstrated an understanding of fair-use guidelines ☐ Utilized interaction and navigational tools including menus, buttons, timer events and user-driven events where needed ☐ Conducted a Alpha and *Beta test* of the project ☐ Completed the project within the predetermined deadline meeting the client's specifications

Multimedia I – Design & Development
Glossary of Terms

Alpha Test: First round of project testing, usually done by "in-house" personnel.

Analogous: Color scheme that uses three colors that are side by side on the color wheel.

Anti-Aliasing: A process that smooths the edges of shapes, such as letters, on a computer screen. *Anti-aliasing* makes jagged edges look smooth by filling in the jags with a similar color.

Asymmetrical: Balance achieved by placing dissimilar objects that have the same visual weight opposite each other.

Balance: Creating equal visual weight to a screen design.

Beta Test: Second round of project testing, usually done by members of the target audience.

Bitmap (raster): An image is stored as a collection of pixels.

Buffer: A temporary storage area that holds data until it is used.

CB or CBT: **C**omputer **B**ased **T**raining. A term used to define training designed to be delivered via CD*ROM*, LAN, etc. over a computer.

Complimentary: Color scheme that uses colors that are opposite each other on the color wheel.

Compression: Storing data in a form that requires less space.

Contrast: Creating a difference between objects. Contrast can be created by size, shape, color, and value.

Clipboard: A special memory area in RAM where data is stored temporarily on a computer.

CPU: **C**entral **P**rocessing **U**nit. is the brains of the computer. The *CPU* is the brain of the computer. This is where information and calculations take place**.**

Digital Watermark: A pattern inserted into a digital image, audio or video file that identifies the file's copyright information (author, rights, etc.). Watermarks are usually barely visible in the image. *Digital watermark*s are used as copyright protection for property that is in a digital format.

Dimension: A measure of spacial distance to create depth. Depth can be created using textures, patterns, details or lack of.

Directed Linear Mode: Presentations where navigation is in a forward and backward direction.

DPI: **D**ots **P**er **I**nch. *DPI* determines the *resolution* of images. The more dots per inch, the higher the *resolution* or clearer the picture.

Emphasis: Creating a strong visual element on the screen so that the reader's eye is drawn to that particular area or object first**.**

First-Depth Prototype: The design of one complete screen, page, frame, etc. of a *multimedia project.* The purpose is to show the color scheme, look and feel, and navigation of a project.

First-Breadth Prototype: Shows the overall flow of a project with navigation etc. Sections do not need to be complete but should how the user will navigate through the project.

Font: A collection of all characters of a single size and style that belong to the same typeface**.** i.e.: 12pt bold Arial

Framing: Placing the center of interest inside objects in the foreground. For example: Using the branches of a tree to create a natural frame for a picture of a building or a person. This can give a picture the

feeling of depth

FTP: **F**ile **T**ransfer **P**rotocol. The protocol used on the Internet for uploading and downloading files.

Graphic Artist: Responsible for the "feel" of the project, the graphic artist designs the interfaces, buttons, graphics, color schemes of a project. Graphic artists usually have a strong art background and are very familiar with design concepts.

Hot Spots: Areas in a *multimedia project* that when moved upon by a mouse or clicked, cause some other action to occur.

Hue: The pure form of the color (red is the pure form of pink). It is basically the name of the color.

IEEE1394: *IEEE1394* is also referred to as firewire. This is a high-speed device for transferring video and other forms of real-time *media* to and from a computer.

Intensity: Sometimes referred to as saturation. *Intensity* is the brightness of the color. Mixing the gray or the color's complement can lower the *intensity* of the color.

Kerning: In typography, *kerning* refers to adjusting the space between characters, especially by placing two characters closer together than normal.

Leading: Pronounced *led-ing,* A typographical term that refers to the vertical space between lines of text.

Leading Lines: Leading lines are natural or manmade lines that lead the viewer's eyes to the subject.

Line: A dot that moves across a surface. Lines can be vertical, horizontal, diagonal, straight, or curved. They can vary in thickness, etc to show weight and perspective.

Linear Mode: Presentations where navigation is in a forward direction only. Navigation is very limited.

Loop: A computer program function which allows an action to occur as many times as is defined or selected.

Mac: *MacIntosh* computer. Manufactured by Apple Computer.

Media: Text, audio, graphics, video, or other components of a multimedia project.

Media/Instructional Designer: Designs and e-learning products. Serves as the curriculum development expert. Designs, writes, and produces the content of course modules and accompanying video scripts, audio scripts, on-screen text, animations, hard copy materials and documentation. Leads development teams consisting of graphic designers, instructional designers, programmers, video specialists, animators and audio specialists. May work within a training department. Works under general supervision. Typically reports to a manager.

Mergers: In photographic composition a merger is a combining of two or more objects. For example having a person stand in front of a tree and it looks like a branch is coming out of his head.

Monochromatic: A color scheme that uses only one *hue*. However, the *hue* can vary in its *tint*, *shade*, and *tone* to give contrast and high and low *values*.

Multimedia Designer/Developer: Responsible for creating and producing graphical interfaces, animations, audio, video and/or still images for use in technology-based education, presentations and the Internet. May also develop print based materials. Requires strong creativity and artistic aptitude. May work in a marketing department. Works under general supervision. Reports to a manager.

Multimedia Project: A complete application put together by an authoring software program normally combining many forms of media (text, audio, video, animation and graphics) into a finished product that can be produced in CD, magnetic (disk) or web format. Another commonly used term for Multimedia Project is Multimedia Title.

Multitask: Having more than one software application open on your desktop at one time.

Patterns: A repetition of something such as lines, shapes, colors, etc.

PAL: ***P****hase* ***A****lternating* ***L****ine,* the dominant television standard in Europe. *PAL* delivers 625 lines at 50 half-frames per second.

NTSC: ***N****ational* ***T****elevision* ***S****tandards* ***C****ommittee*. The *NTSC* is responsible for setting television and video standards in the United States. *NTSC* delivers 525 lines of *resolution* at 60 half-frames per second,

PC: A personal computer using a Windows-based operating system.

Programmer: Responsible for developing, maintaining, documenting and operating moderately complex computer programs and systems in accordance with established standards. Converts symbolic statements to detailed logical flow charts for coding into computer language. Works under general supervision. Reports to a manager.

Proportion: A comparative size relationship of one item to another with respect to size, shape.

RAM: **R**andom **A**ccess **M**emory, or volatile computer memory commonly measured in megabytes (MB). This is read and write memory. System and application software use *RAM* to store information while the application is running. The contents of *RAM* are lost when the power to a computer is interrupted.

Random Mode: Presentations where users can freely in no particular order.

Resolution: Resolution refers to the sharpness and clarity of an image. Resolution on a computer monitor is measured in pixels (number of dots on a computer). Common resolutions are 800x600, 1024x768 etc.

Rich media: *Media* that uses a variety of components such as graphics, audio, video, animation, etc

Rollovers: A button or object that changes somehow or has an event takes place when the cursor passes over it. For example, when the cursor passes over a button the button changes color.

ROM: **R**ead-**O**nly **M**emory, computer memory on which data has been prerecorded. Once data has been written onto a *ROM* chip, it cannot be removed and can only be read. *ROM* holds instructions for starting up a computer. Data on *ROM* is permanent and is not lost when the computer is turned off.

Rule of Thirds: A composition technique where a picture or screen design is divided with two evenly spaced vertical lines that cut the picture in thirds and two evenly space horizontal lines cutting the picture horizontally into thirds. Rather than placing an image in the center, place the image or images at the intersection of the vertical and horizontal lines to create points of interest.

Saturation: Saturation is the intensity or brightness of a color. Lowering the brightness of a color can be achieved by adding gray or the colors complement.

Scale: Representing an image in proportion but smaller or larger than the original.

Scratchdisk: Space on a hard drive that is dedicated for temporary storage of data.

SEOP: Student Education Occupation Plan. An interest/occupation plan set up for a student by a school counselor, the student, and the student's parents to give guidance to the student in planning the courses he/she will be taking in high school, as well as to provide guidance for the student's post-high school goals.

Sequential Mode: Presentations where navigation is guided by a menu.

Shade: Changing the value and intensity of a *hue* by adding black .

Shape: An enclosed space defined by elements such as lines, colors, values, and textures. Shapes are 2 dimensional whereas form is 3 dimensional.

Simplicity: In photographic composition using simplicity refers to keeping the background and surrounding items simple so the point of interest is the emphasis.

SME: Subject Matter Expert. An authority on the subject area of a multimedia project who acts in an advisory capacity to a multimedia team, often providing content.

Space: Space is the distance between something. Positive space is filled with objects and negative space is empty.

Spooling: A special area (*buffer*) in memory or on a disk where data is stored until a device is ready to access. *Spooling* is useful because devices access data at different rates. The *buffer* provides a waiting station where data can rest while the slower device catches up.

Symmetrical: Balance achieved by placing similar elements or objects of the same visual weight in the same positions on either side of a screen design.

Texture: The surface quality of feel of an image. Texturing an image can add an appearance of smoothness, roughness, softness, etc.

Tint: Changing the value and intensity of a *hue* by adding white. For example, adding white to red creates pink.

Timer Events: Actions that occur in a multimedia project that are based on time.

Top-down: A computer programming term that refers to starting at the top of a program and working yourself down to the solution.

Tone: Changing the value and intensity of a hue by adding grey or varying degrees of a *hue*'s complementary color.

Tracking: Adjusting the space between characters.

Tree Mode: Presentations where navigation is controlled by paths.

Triadic: Color scheme that uses three equidistant colors on the color wheel. Choose the three colors by drawing an equilateral triangle within the color wheel. The points of the triangle indicate which colors are to be used.

Tweening: Generating intermediate frames between two images to give the appearance that the first image evolves smoothly into the second image.

Typeface: A design for a set of characters. Popular *typefaces* include Times Roman, Helvetica, and Courier. There are two general categories of *typefaces*: serif and sans serif.

Unity/harmony: An agreement or union between elements or objects on the screen.

USB: **U**niversal **S**erial **B**us. A port on a computer used to connect peripheral devices, such as mice, modems, and keyboards.

User Driven Events: Events that are programmed to be controlled by the user. For example, navigation buttons do nothing until the user clicks on the button.

Value: This is the lightness or darkness of the *hue* or how light or dark a color appears.

Virtual Memory: Special memory that is used like *RAM* but actually resides on a hard drive. Special software manages this memory and gives the *CPU* access to it.

Virus: Basically a *virus* is an electronic infection. *Viruses* are programs or pieces of code that are loaded onto your computer without your knowledge and runs against your wishes. Some *viruses* are harmless but other are devastating.

Variable: A space in a computer's memory that is defined to hold a certain type of data. Variables can be in the form of integers, strings, numbers, etc.

Variable String: Normally a variable defined to be a certain length consisting of alphanumeric characters.

Vector: An image whose shapes are defined mathematically by a series of lines and curves.

Web Designer/Specialist: Responsible for the maintenance of an organization's web sites and web catalogs. May design an organization's web sites and web catalogs. Advises on the technical and design aspects of independently developed web sites planning to tie into an organization's web sites. May work within a marketing department. Works under general supervision. Typically reports to a manager.

WBT: **W**eb **B**ased **T**raining. Training that is delivered via the Internet.

Multimedia II - Production

Level: 11-12
Units of Credit: 1
CIP Code: 11.0211
Prerequisite: **Multimedia I - Design and Development**
Skill Certification Exam: #804

COURSE DESCRIPTION

Multimedia is the process of planning, instructional design, and development. Multimedia Production is the second year multimedia course where students will focus on developing advanced skills to create interactive computer applications using the elements of text, 2-D and 3-D graphics, animation, sound, video, and digital imaging. These skills can prepare students for entry-level positions and other occupational/educational goals.

COURSE STANDARDS AND OBJECTIVES

STANDARD
110211-01 Students will enhance skills in media production and design.

OBJECTIVES
110211-0101 Create and manipulate 2D graphics using a variety of advanced techniques.

110211-0102 Create and manipulate 2D animations using a variety of advanced techniques

110211-0103 Create and manipulate digital Video using a variety of advanced techniques

110211-0104 Create and manipulate digital Audio using a variety of advanced techniques

110211-0105 Review and apply principles and elements of visual design.

STANDARD
110211-02 Students will create a 3D graphic and be introduced to animation.

OBJECTIVES
110211-0201 Create a 3D wire frame model

110211-0202 Understand and be able to create 3D composites

110211-0203 Render a model using appropriate visual effects (background, textures, lighting, etc.)

110211-0204 Animate objects using the key frame method

110211-0205 Animate objects using the path method

STANDARD
110211-03 Students will create a group project that is Computer-based (*CB*) or Web-based (*WB*) to be used by a class or school in the student's school district.

OBJECTIVES

110211-0301 Create a group project incorporating advanced skills using appropriate multimedia production techniques including the following:

- Principles and Elements of Visual Design
- Project Planning
- Teamwork
- Media Production
- Copyright and fair use guidelines.

110211-0302 A Computer-based (*CB*) project should contain each of the following elements:

- Text
- Animation
- Interactivity
- Audio
- Digital images
- Digital video
- Analysis and feedback
- Use of two or more pieces of software beyond the authoring software

110211-0303 A Web-based (*WB*) project should contain each of the following elements:

- Text
- Animation including *rollovers* and animated GIFs (Flash and *Panoramas* optional)
- Interactivity including links and *image slicing*/*image maps*
- Audio optimized for web delivery
- Digital images optimized for web delivery
- Digital video optimized for web delivery
- Use of two or more pieces of software beyond the authoring software

110211-0304 The group project should ideally be something significant that can be used by a school or class in the student's school district. Examples of projects include:

- Cross-curricular activities.
- Favorite subject in school (reading, writing, math, etc.).
- School orientation (freshmen or sophomores).
- *SEOP* process.
- Registration (course listings) on-line list.
- Digital yearbook.
- Other viable topics.

STANDARD
110211-04 Students will create an interactive multimedia portfolio for digital delivery which showcases a student's projects, work, and skills. Projects can be created individually or as a team member.

OBJECTIVES:

110211-0401 Individually author an interactive portfolio of multimedia projects completed

110211-0402 Create a menu-driven digital portfolio including the following elements with strict adherence to copyright and fair use guidelines:

- Animation
- Audio
- 2D graphics
- 3D graphics
- Video
- Project Designs (storyboards and *concept drawings*)
- Projects (individual and/or group)
- Resume
- State Multimedia Performance Evaluations (optional)

110211-0403 Output the project to CD or DVD in executable format with necessary *drivers*/plugins, etc.

STANDARD
110211-05 Students will participate in a work-based learning experience and/or competition.

OBJECTIVES

110211-0501 Participate in a work-based learning experience.

- Field trip to a software engineering firm
- Job shadow
- Internship
- Industry guest speaker
- Post-secondary guest speaker

110211-0502 Participate in a multimedia student competition.

- School Multimedia Contest
- Utah Multimedia Arts Festival
- Various Logo Contests
- Other Student Competitions

UTAH ATE SKILL CERTIFICATION
STUDENT PERFORMANCE EVALUATION
Test Number: #815 Test Name: Multimedia II - Production

(PRINT) Student's Name: _____ Date: _____

(PRINT) Teacher's Name: _____ School: _____

Teacher's Signature: _____ District: _____

The performance evaluation **is a required component of the skill certification process**. Each student must be evaluated on the required performance objectives below. Performance objectives may be completed and evaluated anytime during the course. Students who achieve a 3 or 4 (moderately to highly skilled) on **ALL** performance objectives, and 80% on the written test will be issued and ATE skill certificate.

Instructions

- Students should be aware of their progress throughout the course, so that they can concentrate on the objectives that need improvement.
- Students should be encouraged to repeat the objectives until they have performed at a minimum of a number **3 or 4 on the rating scale (moderately to highly skilled level)**.

4 = highly skilled	Successfully demonstrated without supervision
3 = moderately skilled	Successfully demonstrated with limited supervision
2 = limited skill	Demonstrated with close supervision
1 = not skilled	Demonstration requires direct instruction and supervision

- When a performance objective has been achieved at a minimum of 80% (moderately to highly skilled level), "**Y" (Y=YES)** is recorded on the performance summary evaluation form. If a student does not achieve a 3 or a 4 (moderately to highly skilled level), then an "**N"(N=NO)** is recorded on the summary sheet for that objective.
  - All performance objectives **MUST** be completed and evaluated prior to the written test.
  - The teacher will bubble in "**A"** on the ATE skill certification answer sheet (SCANTRON) for item **#81** for students who have achieved "**Y"** on **ALL performance objectives**.
  - The teacher will bubble in "**B"** on the ATE skill certification answer sheet (SCANTRON) for item **#81** for students who have **ONE or more "N's"** on the performance objectives.
- The signed evaluation sheet(s) **MUST** be kept in the teacher's file for two years.
- A copy is also kept on file with the schools ATE skills certification testing coordinator for two years.

Multimedia II - Production
Performance Objectives

Yes		No		
4	3	2	1	**Standard 1 – The student enhanced their skills in media production and design.**
				☐ Enhanced skills in media production and design in the areas of 2D graphics and animation, and digital video and audio ☐ Reviewed and applied principles and elements of visual design
Yes		**No**		**Standard 2 - The student created a 3D graphic was introduced to animation.**
4	**3**	**2**	**1**	
				☐ Created a 3D wire frame model ☐ Created a 3D composite ☐ Rendered a 3D model using appropriate visual effects ☐ Animated objects using key-frame and path animation
Yes		**No**		**Standard 3 – The student created a group project (CB or WB) to be used in the school or district.**
4	**3**	**2**	**1**	
				☐ Understands career opportunities in the *multimedia* industry ☐ Demonstrated employability skills such as responsibility, dependability, ethics, respect and cooperation ☐ Performed with a positive work ethic and attitude ☐ Developed a realistic Student Education Occupation Plan (*SEOP*) to guide further educational/occupational pursuits
Yes		**No**		**Standard 4 - Students will create an interactive multimedia portfolio for digital delivery which showcases the student's projects, work, and skill. Project samples can be created individually or as a member of a team.**
4	**3**	**2**	**1**	
				☐ Created a menu-driven, interactive portfolio burned to CD-*ROM* or DVD of the student=s projects and multimedia assignments completed ☐ The portfolio includes samples of the student's animation, audio, video, 2D graphics, 3D graphics (optional) work and group projects the student has contributed to ☐ The student's resume is also included as part of the portfolio
Yes		**No**		**Standard 5 - The student has participated in a work-based learning experience and/or competition.**
4	**3**	**2**	**1**	
				☐ Participated in a work-based learning experience such as a job shadow, internship, field trip to a software engineering firm or listened to an industry guest speaker and/or competed in a high school multimedia competition

Multimedia II – Production
Glossary of Terms

Anti-aliased: Blending the colors along the edges of graphics or text to create a soft transition between the image and the background.

Bandwidth: The amount of data that can be transmitted over a specified amount of time. Data is measured in Bits per Second (bps)

CB: Projects, software, presentations, etc. that are designed to be delivered on a computer system via CD-Rom or DVD.

Compression: Storing data in a form that requires less space.

Concept Drawings: Rough sketches of items such as interface designs, characters for animation etc.

Drivers: A program that controls a device such as a printer or a disk drive.

Frames: A feature in web browsers that allow web pages to be displayed in different sections. Each section is an individual web page.

Image Slicing/Maps: HTML code that tells a browser to divide and image into hot spots (a clickable region on a web page).

Optimization: Reducing the size, number of colors used and quality of an image so the file size is manageable but the image still looks good.

Panorama: A picture presenting a view of objects in every direction, as from a central point. Users can move back and forth and see the entire surrounding area.

Plug-ins: Pieces of software that add additional features to a web browser. For example a plug-in could help a browser display different types of audio or video messages

Resolution: Resolution refers to the sharpness and clarity of an image. Resolution on a computer monitor is measured in pixels (number of dots on a computer). Common resolutions are 800x600, 1024x768 etc.

Rollovers: A button or object that changes somehow or has an event takes place when the cursor passes over it. For example, when the cursor passes over a button the button changes color.

SEOP: Student Education Occupation Plan. An interest/occupation plan set up for a student by a school counselor, the student, and the student's parents to give guidance to the student in planning the courses he/she will be taking in high school, as well as to provide guidance for the student's post-high school goals.

Streaming: A technique that allows data to be downloaded or transferred as a continuous "stream". As soon as enough data is downloaded to begin playing it will start while the rest continues to download. For example a streaming video will begin playing before it is totally downloaded.

Tables: A feature in web browsers and web development tools that allow data to be arranged in rows and columns.

WB: Projects, software, presentations, etc. that are designed to be delivered via the internet.

Web Languages: html, dhtml, Java, xml, Cold Fusion Etc.

Web Safe Colors: A set of colors (approximately 216) that will display the same on various computer platforms and browsers.

Multimedia Resources

Books:

Complete Guide to Video	**John Hedgecoe (Collins and Brown)**
Color	**Paul Zelanski and Mary Pat Fisher**
Design Basics	**David A. Lauer and Stephen Pentak**
Design Yourself	**Hanks, Edward and Belliston**
Designing Multimedia	**Lisa Lopuck (Peachpit Press)**
How Computers Work **(book and CD-ROM)**	**Ron White (Zif-Davis Press)**
In Your Face - The Best of Interactive Interface Design	**Daniel Donnelly**
Light and Color	**Rainwater (Golden Press)**
Managing Multimedia Projects	**Roy Strauss (Focal Press)**
Multimedia Demystified	**Apple Computer, Inc. (Random House)**
Multimedia: Making It Work	**Tay Vaugham (Osborne)**
Multimedia Producer's Bible	**Ron Goldberg (IDG) (**
Sullivan's Scanning Tips and Techniques	**Michael J. Sullivan**
The Non-designer's Handbook	**Robin Williams**
The Photographer's Handbook	**John Hedgecoe**
The Osborne Complete Book of Drawing	**Osborne**
Theoretical Foundations of Multimedia	**Robert Tannebaum (Freeman)**

Websites:

www.3dcafe.com	**3-D information and samples**
www.adobe.com	**Photoshop, Premiere, Illustrator, etc.**
www.allencomm.com	**Quest, Designer=s Edge, Manager=s Edge site**
www.asymetrix.com	**Home page for Asymetrix (makers of ToolBook)**
www.commarts.com	**Design site**
www.fractal.com	**Painter site**
www.kodak.com	**Great site for tips on photography**
www.macromedia.com	**Flash, Dreamweaver, Fireworks FreeHand, Director, Authorware**
www.ruku.com	**Good site for tutorials on Photoshop, etc.**
www.soundcentral.com	**Sound samples, etc.**
www.tucows.com	**Good source of freeware and shareware**
www.viewpoint.com	**Home page for Viewpoint Datalabs (3-D graphics company)**
www.zednet.com	**Magazine site**

See www.usoe.k12.ut.us/it/cool.htm for additional web sites.

Magazines:

Adobe Magazine
Electronic Design
Electronic Publishing
Presentations
Publish
Step by Step
Technology Training

Software (Programs) Needed:

Operating system software:	**Windows with Sound Recorder, CD player, and Volume Control Mixer, or equivalent Macintosh operating system**
Photo editing software:	**Adobe Photoshop, Macromedia Fireworks, etc.**
Bitmap drawing software:	**Fractal Painter, Paint Shop Pro, etc.**

Vector drawing software:	**Adobe Illustrator, Macromedia Freehand or Flash, Corel Presentations/Draw, etc.**
Video editing software:	**Adobe Premiere, Final Cut Pro, Digital Video Producer, etc.**
Audio editing software:	**Sound Forge, Cool Edit, etc.**
.midi editing/creation software:	**CakeWalk, WindJammer, etc.**
3-D animation/modeling software:	**TrueSpace, 3-D Studio Max, Bryce 3-D, Maya, Strata etc.**
Authoring software:	**Quest, Director, Toolbook, iShell, Astound, MediaForge, etc.**
Word processing software:	**Designer's Edge, MS Word, WordPerfect, etc.**
Scanning software:	**Whatever comes packaged with the scanner**

Hardware (Equipment) Recommendations for Multimedia:

PC

Pentium III processor (400+ mHz or higher)
256+ RAM
Zip, Jazz drive or equivalent storage device is highly recommended
Hard drive: 6 gig minimum (as large as you can afford)
CD-ROM
High-resolution video card
Sound card/speakers

Macintosh

G4 processor (266 mHz or higher)
256+ RAM
Zip, Jazz drive or equivalent storage device is highly recommended
Hard drive: 6 gig minimum (as large as you can afford)
CD-ROM
High-resolution video card
Sound card/speakers

*** Note: Because of the high processing demands of multimedia, it is recommended that hardware for multimedia programs be upgraded at a minimum of every two years. Rotate your multimedia labs to other labs in the school. Consider working out leasing agreements to stay current.**

Other Equipment Needed (Required)

CD burner
Computer network with large hard-drive storage capacity (10 G+)
Digital camera
Internet access
LCD projector or equivalent demonstration software
Scanner
VCR
Video capture card/device (one minimum)

Optional Equipment

DAT recorder
DVD drive
Midi keyboard
Video camera (digital recommended) with Firewire input/output
Wacom tablet

Appendix

Fair Use Guidelines for Education:

Motion Media	**Up to 10 percent or three minutes, whichever is less**
Text Material	**Up to 10 percent or 1,000 words, whichever is less, in the aggregate of a copyrighted work**
Music, Lyrics, and Music Video	**Up to 10 percent, but in no event more than 30 seconds of the music and lyrics from an individual musical work**
Illustrations and Photographs	**No more than five images by an artist or photographer may be reproduced or otherwise incorporated as part of an qualifying educational multimedia project**